Final

Record of Decision for Wet Sediment and Surface Water at RVAAP-12 Load Line 12

Former Ravenna Army Ammunition Plant Portage and Trumbull Counties, Ohio

Contract No. W912QR-15-C-0046

Prepared for:



US Army Corps of Engineers®

U.S. Army Corps of Engineers Louisville District

Prepared by:



Leidos 8866 Commons Boulevard, Suite 201 Twinsburg, Ohio 44087

February 22, 2019

Final

Record of Decision for Wet Sediment and Surface Water at RVAAP-12 Load Line 12

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Mike DeWine, Governor Jon Husted, Lt. Governor Laurie A. Stevenson, Director

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US Army Ravenna Ammunition Plt RVAAP **Remediation Response Project records Remedial Response** Portage County 267000859122

Final Record of Decision (ROD) for "Wet Sediment and Surface Water Subject: at RVAAP-12 Load Line 12"

Dear Mr. Connolly:

Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Record of Decision for Wet Sediment and Surface Water at RVAAP-12 Load Line 12" This document was received by Ohio EPA NEDO on February 22, 2019. It was prepared by Leidos, contractor for the US Army Corps of Engineers.

Ohio EPA has no comments on the Final Record of Decision (ROD) for Wet Sediment and Surface Water at RVAAP-12 Load Line 12. Based on the information contained in the Final ROD document, other investigation documents and reports, and Ohio EPA's oversight participation during the investigation. Ohio EPA concurs with the Final ROD document for RVAAP-12 Load Line 12 recommending No Further Action.

If you have any questions concerning this letter, please contact Sue Netzly-Watkins, Ohio EPA-NEDO (330) 963-1201.

Sincerely.

James Sferra, Chief Division of Environmental Response and Revitalization

Nat Peters, USACE ec: Katie Tait/Kevin Sedlak, OHARNG RTLS Craig Coombs, USACE Rebecca Shreffler, Chenega David Connolly, ARNG Mark Johnson, Ohio EPA, NEDO DERR Bob Princic, Ohio EPA, NEDO DERR Tom Schneider, Ohio EPA, SWDO DERR 50 West Town Street • Suite 700 • P.O. Box 1049 • Columbus, OH 43216-1049 epa.ohio.gov • (614) 644-3020 • (614) 644-3184 (fax)

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CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Leidos has completed the Record of Decision for Wet Sediment and Surface Water at RVAAP-12 Load Line 12 at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives; technical assumptions; methods, procedures, and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing U.S. Army Corps of Engineers policy. In addition, an independent verification was performed to ensure all applicable changes were made per regulatory and Army comments.

Heather Adams, P.G. Study/Design Team Leader

February 22, 2019 Date

February 22, 2019 Date

Jed Thomas, P.E., PMP Independent Technical Review Team Leader

Significant concerns and the explanation of the resolution are documented within the project file. As noted above, all concerns resulting from independent technical review of the project have been considered.

Lisa Jones-Bateman Senior Program Manager

February 22, 2019 Date

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Former Ravenna Army Ammunition Plant Portage and Trumbull Counties, Ohio

Contract No. W912QR-15-C-0046

Prepared for: U.S. Army Corps of Engineers 600 Martin Luther King, Jr. Place Louisville, Kentucky 40202

Prepared by: Leidos 8866 Commons Boulevard, Suite 201 Twinsburg, Ohio 44087

February 22, 2019

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ARNG = Army National Guard.

I&E = Installations & Environment.

NEDO = Northeast District Office.

OHARNG = Ohio Army National Guard.

Ohio EPA = Ohio Environmental Protection Agency.

REIMS = Ravenna Environmental Information Management System.

SWDO = Southwest District Office.

USACE = U.S. Army Corps of Engineers.

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ACRONYMS AND ABBREVIATIONS

amsl	Above Mean Sea Level
AOC	Area of Concern
Army	U.S. Department of the Army
ARNG	Army National Guard
bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CJAG	Camp James A. Garfield
CMCOPC	Contaminant Migration Chemical of Potential Concern
COC	Chemical of Concern
COPC	Chemical of Potential Concern
COPEC	Chemical of Potential Ecological Concern
DFFO	Director's Final Findings and Orders
ERA	Ecological Risk Assessment
FS	Feasibility Study
FWCUG	Facility-wide Cleanup Goal
FWGWMP	Facility-wide Groundwater Monitoring Program
HHRA	Human Health Risk Assessment
HQ	Hazard Quotient
IRP	Installation Restoration Program
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
PAH	Polycyclic Aromatic Hydrocarbon
PBA08 RI	2008 Performance-based Acquisition Remedial Investigation
PCB	Polychlorinated Biphenyl
RI	Remedial Investigation
ROD	Record of Decision
RSL	Regional Screening Level
RVAAP	Ravenna Army Ammunition Plant
SEMS	Superfund Environmental Management System
SL	Screening Level
SRC	Site-related Contaminant
SVOC	Semi-volatile Organic Compound
TNT	2,4,6-Trinitrotoluene
TR	Target Risk
USEPA	U.S. Environmental Protection Agency
USP&FO	U.S. Property and Fiscal Officer
VOC	Volatile Organic Compound

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A SITE NAME AND LOCATION

This Record of Decision (ROD) addresses wet sediment and surface water media at Load Line 12. Load Line 12 is designated area of concern (AOC) RVAAP-12 within the former Ravenna Army Ammunition Plant (RVAAP), Ravenna, Ohio (Figures 1 and 2).

The former RVAAP, now known as Camp James A. Garfield (CJAG), located in northeastern Ohio within Portage and Trumbull counties, is approximately 3 miles east/northeast of the city of Ravenna and 1 mile north/northwest of the city of Newton Falls. The facility is approximately 11 miles long and 3.5 miles wide. The facility is bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad to the south; Garrett, McCormick, and Berry Roads to the west; the Norfolk Southern Railroad to the north; and State Route 534 to the east. In addition, the facility is surrounded by the communities of Windham, Garrettsville, Charlestown, and Wayland. The facility is federal property, which has had multiple accountability transfers amongst multiple Army agencies, making the property ownership and transfer history complex. The most recent administrative accountability transfer occurred in September 2013 when the remaining acreage (not previously transferred) was transferred to the U.S. Property and Fiscal Officer for Ohio (USP&FO) and subsequently licensed to the Ohio Army National Guard (OHARNG) for use as a military training site (Camp James A. Garfield).

Load Line 12 is located in the southeastern portion of CJAG. The Superfund Environmental Management System (SEMS) Identifier for RVAAP is OH5210020736.

B STATEMENT OF BASIS AND PURPOSE

The Army National Guard (ARNG) is the lead agency and has chosen the selected remedy for Load Line 12 in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on information contained in the Administrative Record file for the AOC.

The Ohio Environmental Protection Agency (Ohio EPA), the supporting state regulatory agency, concurred with the *Phase III Remedial Investigation Report for Wet Sediment and Surface Water at RVAAP-12 Load Line 12* (USACE 2017a; herein referred to as the Phase III Remedial Investigation [RI] Report) and *Proposed Plan for Wet Sediment and Surface Water at RVAAP-12 Load Line 12* (USACE 2017b; herein referred to as the Load Line 12 Proposed Plan).

The Director's Final Findings and Orders (DFFO) was issued to the U.S. Department of the Army (Army) on June 10, 2004 (Ohio EPA 2004). The objective of the DFFO was for the Army and Ohio EPA to "contribute to the protection of public health, safety, and welfare and the environment from the disposal, discharge, or release of contaminants at or from the site, through implementation of a CERCLA-based environmental remediation program. This program will include the development by

respondent of a remedial RI/FS for each AOC or appropriate group of AOCs at the site, and upon completion and publication of a Proposed Plan and ROD or other appropriate document for each AOC or appropriate group of AOCs, the design, construction, operation and maintenance of the selected remedy as set forth in the ROD or other appropriate document for each AOC or appropriate group of AOCs."

The RI Report evaluated wet sediment and surface water at Load Line 12 and recommended no further action for these media. The decision that no further action is required for wet sediment and surface water at Load Line 12 satisfies the requirements of the DFFO, as the Army and Ohio EPA completed the CERCLA RI/feasibility study (FS) phase of investigation. Part II, Section G explains how the human health and ecological risks were assessed and how this no further action conclusion was made.

Soil and dry sediment are not included in this ROD; they were addressed in the *Record of Decision* for Soil and Dry Sediment at RVAAP-12 Load Line 12 (USACE 2009) and are currently being further evaluated in the Feasibility Study Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12 (USACE 2017c).

C DESCRIPTION OF THE SELECTED REMEDY

No further action is necessary for wet sediment and surface water at Load Line 12 for Unrestricted (Residential) Land Use, as no CERCLA-related chemicals of concern (COCs) were identified in wet sediment or surface water for the Resident Receptor. Land use controls and five-year reviews will not be required or implemented as part of this decision.

Soil, dry sediment, and groundwater at Load Line 12 are being addressed separately under CERCLA.

D STATUTORY DETERMINATIONS

The recommendation of no further action for wet sediment and surface water is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because the CERCLA-related contamination present in wet sediment and surface water at Load Line 12 does not pose a potential risk to human health or the environment, five-year reviews will not be required. No other remedial action is necessary to ensure protection of human health and the environment for these media.

E AUTHORIZING SIGNATURE AND APPROVAL

7 June Zole William M. Myer COL, GS I&E, Army National Guard

A SITE NAME, LOCATION, AND DESCRIPTION

When the RVAAP Installation Restoration Program (IRP) began in 1989, RVAAP (SEMS Identification Number OH5210020736) was identified as a 21,419-acre installation. In 2002 and 2003, OHARNG surveyed the property, and the total acreage of the property was found to be 21,683 acres. The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683-acre former RVAAP.

As of September 2013, administrative accountability for the entire acreage of the facility has been transferred to the USP&FO for Ohio and subsequently licensed to OHARNG for use as a military training site. ARNG is the lead agency for any remediation, decisions, and applicable cleanup at Load Line 12. These activities are being funded and conducted under the IRP. Ohio EPA is the supporting state regulatory agency.

CJAG is located in northeastern Ohio within Portage and Trumbull counties, approximately 4.8 km (3 miles) east-northeast of the city of Ravenna and approximately 1.6 km (1 mile) northwest of the city of Newton Falls. References in this document to RVAAP relate to previous activities at the facility as related to former munitions production activities or to activities being conducted under the restoration/cleanup program.

CJAG is a parcel of property approximately 17.7 km (11 miles) long and 5.6 km (3.5 miles) wide, bounded by State Route 5 and the CSX System Railroad on the south; Garrett, McCormick, and Berry roads on the west; the Norfolk Southern Railroad on the north; and State Route 534 on the east (see Figures 1 and 2). CJAG is surrounded by several communities: Windham 11.2 km (7 miles) to the north, Garrettsville 9.6 km (6 miles) to the north, Newton Falls 1.6 km (1 mile) to the southeast, Charlestown 3.6 km (6 miles) to the southwest, and Wayland 4.8 km (3 miles) to the south.

Load Line 12 is an approximately 76-acre fenced AOC located in the southeastern portion of CJAG, south of Newton Falls Road, east of Paris-Windham Road, north of South Service Road, and west of Load Line 3 (Figure 2). Load Line 12 was historically used as an ammonium nitrate plant, used to produce M54 primers, and had a pink water treatment plant.

Currently, no aboveground structures remain at Load Line 12. Buildings at Load Line 12, including building slabs and foundations, were decontaminated, demolished, and removed in December 1998 through June 2000. Remaining features at Load Line 12 include asphalt and gravel access roads, constructed drainage ditches and ponds, and railroad beds, as presented in Figure 3. The Load Line 12 fence is still in place, but it is not currently maintained. Load Line 12 is currently overgrown with grass, trees, and scrub vegetation.

Load Line 12 data were aggregated to evaluate contaminant nature and extent and complete the human health risk assessment (HHRA) and environmental risk assessment (ERA). The initial basic aggregation of data was by environmental medium (e.g., sediment and surface water). For each

medium-specific aggregate, further aggregation or grouping of sample data was performed, usually by a certain area or common feature such as a pond or ditch. These aggregates are called "spatial aggregates" in the *Phase II Remedial Investigation Report for Load Line 12* (USACE 2004) and this ROD. These aggregates are presented in Figure 4 and are described in the following subsections.

A.1 Soil and Dry Sediment

Soil and dry sediment aggregates are not included in the scope of this ROD. These aggregates include the Western Soil, Eastern Soil, Main Ditch, and West Ditches.

In 2009, the *Record of Decision for Soil and Dry Sediment at RVAAP-12 Load Line 12* (USACE 2009) documented the selected remedial alternative (Excavation of Soil/Dry Sediment with Off-site Disposal – National Guard Trainee Land Use). The ROD was signed by the Branch Chief for the Base Realignment and Closure Division on August 20, 2009 and the Director of the Ohio EPA on October 13, 2009.

The remedial alternative was implemented in June 2010 to achieve National Guard Training Land Use (now referred to as Military Training Land Use). A total of 1,181 tons of arsenic-contaminated dry sediment was removed from the Main Ditch. On August 16, 2010, Ohio EPA issued an approval letter for completing the remedial action.

In June 2017, the Army finalized the *Feasibility Study Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12* (USACE 2017c). This FS addendum was completed, in part, to provide an updated HHRA and evaluate remediation scenarios for the Resident Receptor (Adult and Child) and Industrial Receptor [U.S. Environmental Protection Agency (USEPA) Composite Worker] for soil and dry sediment at Load Line 12.

A.2 Wet Sediment

The wet sediment aggregates at Load Line 12 include the Active Area Channel, Former Settling Pond, and North of Active Area. These wet sediment aggregates are addressed in this ROD, are described below, and are shown in Figure 4.

Active Area Channel – The Active Area Channel flows west to east from Atlas Scrap Yard and Paris-Windham Road toward the Eastern Soil aggregate, immediately south of former Building 904, and intersects the primary north-south Main Ditch between the locations of former Buildings 900 and 901.

The Main Ditch (remediated in June 2010) drains north into the Active Area Channel at the western boundary of the Eastern Soil aggregate, at which point the Active Area Channel flows north toward the North of Active Area.

A 3.7-acre wetland is adjacent to and south of the Active Area Channel. This wetland is identified as Wetland 2 in the Phase III RI Report (USACE 2017a).

Former Settling Pond – The Former Settling Pond is a large, constructed basin located adjacent to the Active Area Channel. The Former Settling Pond was originally part of the Active Area Channel aggregate in the Phase II RI Report (USACE 2004); however, the Phase III RI Report established and evaluated this pond as its own unique aggregate.

The pond is approximately 150 ft east of the footprint for former Building 904, slightly curved, and approximately 250 ft long and 50 ft wide. Surface water within the Former Settling Pond originates from the Active Area Channel and surface water runoff from the former Load Line 12 process area north of the Active Area Channel. Surface water enters the Former Settling Pond from the Active Area Channel via a ditch and storm water runoff. Surface water eventually discharges from the Former Settling Pond into the Active Area Channel via an overflow pipe.

North of Active Area – The North of Active Area aggregate is north of the Load Line 12 fence line and north of Newton Falls Road. The aggregate receives surface water that exits the AOC from the Active Area Channel. The North of Active Area aggregate consists of two streams surrounded by wetlands that ultimately discharge into the Backwater Area aggregate of the Upper and Lower Cobbs Ponds AOC. In recent years, a beaver colony has constructed dams north of Load Line 12. These dams restrict surface water drainage from Load Line 12, and stagnant water often resides within the Main Ditch, Former Settling Pond, and Active Area Channel.

An 8.8-acre wetland is immediately adjacent to and surrounds the North of Active Area aggregate. This wetland is identified as Wetland 1 in the Phase III RI Report and receives surface water runoff from areas north of Load Line 12 and east of Paris-Windham Road.

A.3 Surface Water

Surface water at Load Line 12 is present perennially within the Active Area Channel and Former Settling Pond. The series of constructed channels within Load Line 12 convey drainage from within Load Line 12 toward the North of Active Area. Because the water is contiguous, surface water from Load Line 12 was assessed as one exposure unit.

B SITE HISTORY AND ENFORCEMENT ACTIVITIES

RVAAP was constructed in 1940 and 1941 for depot storage and ammunition assembly/loading and placed on standby status in 1950. The primary purpose of the former RVAAP was to load medium and major caliber artillery ammunition (i.e., bombs, mines, fuzes and boosters, primers, and percussion elements) and store finished components. Load Lines 5–11 produced fuzes, boosters, primers, detonators, and percussion elements.

In June 2004, the DFFO was issued to the Army (Ohio EPA 2004). The objective of the DFFO was for the Army and Ohio EPA to "contribute to the protection of public health, safety, and welfare and the environment from the disposal, discharge, or release of contaminants at or from the site, through implementation of a CERCLA-based environmental remediation program. This program will include the development by respondent of a RI/FS for each AOC or appropriate group of AOCs at the site,

and upon completion and publication of a Proposed Plan and ROD or other appropriate document for each AOC or appropriate group of AOCs, the design, construction, operation and maintenance of the selected remedy as set forth in the ROD or other appropriate document for each AOC or appropriate group of AOCs."

Load Line 12, originally known as an ammonium nitrate plant, is a 76-acre fenced AOC located south of Newton Falls Road, east of Paris-Windham Road, and north of South Service Road (Figure 2). The AOC is located in the southeastern portion of CJAG, west of Load Line 3 and east of Load Line 4.

The historical operations at Load Line 12 are summarized below:

- The ammonium nitrate plant began operations on November 25, 1941. Structures related to producing ammonium nitrate were the Neutral Liquor Building (Building FF-19) and seven evaporation/crystallization units (Buildings 900 through 906). The finished product was transferred from Building FN-54 to the melt-pour lines for blending with 2,4,6-trinitrotoluene (TNT) to produce Amatol. Ammonium nitrate production was terminated in May 1943.
- From 1946–1950, a private contractor (Silas Mason Company) leased Load Line 12 to produce 470,080 metric tons (518,246 tons) of fertilizer-grade ammonium nitrate. From 1965–1967, Hercules Alcor, Inc. leased Building FF-19 to produce aluminum chloride.
- From 1969–1971, Load Line 12 was activated in support of the Southeast Asian conflict. Load Line 12 produced 80,000,000 M54 primers during this timeframe (USATHAMA 1978).
- In 1981, the Load Line 12 Pink Water Treatment Plant was built immediately east of Building 904 to treat the demilitarization effluent prior to discharge. The treatment plant consisted of a dual-mode activated-carbon filtration system.
- From 1949–1993, munitions were periodically demilitarized at Load Line 12.

No historical information exists to indicate Load Line 12 was used for any other processes other than what is presented above. No CERCLA enforcement actions related to Load Line 12 have occurred.

C COMMUNITY PARTICIPATION

Using the RVAAP community relations program, the Army and Ohio EPA have interacted with the public through public notices, public meetings, reading materials, direct mailings, an internet website, and receiving and responding to public comments. Specific items in the community relations program include the following:

• **Restoration Advisory Board** – The Army established a Restoration Advisory Board in 1996 to promote community involvement in U.S. Department of Defense environmental cleanup activities and allow the public to review and discuss the progress with decision makers. Board meetings are generally held two to three times per year and are open to the public.

- **Community Relations Plan** The *Community Relations Plan* (Vista 2017) is maintained to establish processes to keep the public informed of activities at RVAAP. The plan is available in the Administrative Record at CJAG.
- **Internet Website** The Army established an internet website in 2004 for RVAAP. It is accessible to the public at www.rvaap.org.

In accordance with CERCLA Section 117(a) and NCP Section 300.430(f)(2), the Army released the Load Line 12 Proposed Plan (USACE 2017b) to the public on June 6, 2018. The proposed plan and other project-related documents were made available to the public in the Administrative Record maintained at CJAG and in the Information Repositories at Reed Memorial Library in Ravenna, Ohio, and Newton Falls Public Library in Newton Falls, Ohio. A notice of availability for the proposed plan was sent to radio stations, television stations, and newspapers (e.g., *Warren Tribune-Chronicle* and *Ravenna Record Courier*), as specified in the Community Relations Plan. The notice of availability initiated the 30-day public comment period beginning June 6, 2018 and ending July 6, 2018.

The Army held a public meeting on June 21, 2018 at the Shearer Community Center, 9355 Newton Falls Road, Ravenna, Ohio 44266 to present the Load Line 12 Proposed Plan. At this meeting, representatives of the Army provided information and were available to answer any questions. A transcript of the public meeting is available to the public and has been included in the Administrative Record. Responses to any comments received at this meeting and during the public notification period are included in the Responsiveness Summary, which is Part III of this ROD.

The Army considered public input from the public meeting on the Load Line 12 Proposed Plan when selecting the remedy.

D SCOPE AND ROLE OF RESPONSE ACTIONS

The overall program goal of the IRP at the former RVAAP is to clean up previously contaminated lands to reduce contamination to concentrations that are not anticipated to cause risks to human health or the environment. Load Line 12 is one of the designated IRP sites at the former RVAAP.

This ROD addresses wet sediment and surface water at Load Line 12. The concentrations of CERCLA-related contamination in wet sediment and surface water at Load Line 12 are considered protective of human health and do not represent a risk to the environment. Therefore, these media are already protective for Unrestricted (Residential) Land Use, and the program goal of the IRP at RVAAP has been met for Load Line 12.

Potential impacts to groundwater from sediment (e.g., contaminant leaching) were evaluated in the Phase III RI Report, as protectiveness to groundwater was included in the fate and transport analysis. However, groundwater will be evaluated as an individual AOC for the entire facility (designated as RVAAP-66) under the Facility-wide Groundwater Monitoring Program (FWGWMP).

E SITE CHARACTERISTICS

This section presents site characteristics, nature and extent of contamination, and the conceptual site model for Load Line 12. These characteristics and findings are based on investigations conducted from 1978–2012 and are further summarized in the Phase III RI Report (USACE 2017a).

E.1 Physical Characteristics

This section describes the topography/physiology, geology, hydrogeology, and ecological characteristics of CJAG and Load Line 12 that were key factors in identifying the potential contaminant transport pathways, receptor populations, and exposure scenarios to evaluate human health and ecological risks.

E.1.1 <u>Topography/Physiography</u>

The topography of CJAG is gently undulating with an overall decrease in ground elevation from a topographic high of approximately 1,220 ft above mean sea level (amsl) in the far western portion of the facility to low areas at approximately 930 ft amsl in the far eastern portion. The topography at Load Line 12 is generally flat at approximately 980 ft amsl, with a topographic high in the eastern portion of the AOC that slopes slightly downward to the topographic low in the western portion of the AOC. Surface water follows topographic relief and drains into constructed ditches across the AOC, which ultimately drain north to Upper and Lower Cobbs Ponds.

All buildings and structures have been demolished and building slabs and footers have been removed. Surface soil was highly disturbed during demolition activities that occurred between 1998 and 2000. Remaining features at Load Line 12 include asphalt and gravel access roads and constructed drainage ditches and ponds.

E.1.2 <u>Geology</u>

As shown in Figure 5, Load Line 12 is located within Hiram Till glacial deposits. At Load Line 12, unconsolidated zone characteristics may vary in character due to AOC disturbances, including building construction, demolition, and re-grading.

The two soil types found at the AOC are the Trumbull silt loam (0-2%), which is present across the western 70% of Load Line 12, and the Mahoning silt loam in the central eastern portion. The Trumbull silt loam is gently sloping, poorly drained soil formed in silty clay glacial till. The Trumbull silt loam is present as depressional landforms where the water table is close to ground surface and generally where bedrock is greater than 6 ft below ground surface (bgs). Runoff is typically medium to rapid, and the soil is seasonally wet (USDA 2010).

As shown in Figure 6, the bedrock formation at Load Line 12, as inferred from existing geologic data, is the Pennsylvanian age Pottsville Formation, Sharon Shale Member. When encountered, bedrock

was observed at 15 ft bgs in the northern end of the AOC and 34 ft bgs in the southern portion of the AOC.

E.1.3 <u>Hydrogeology</u>

Fourteen groundwater monitoring wells were installed at Load Line 12 during the 2000 Phase II RI, and five groundwater monitoring wells were installed as part of the 2004 Characterization of 14 AOCs (MKM 2007). Monitoring wells at the AOC ranged in completion from 18.5–36.1 ft bgs. Although some wells are completed in bedrock, all monitoring wells at Load Line 12 were installed to monitor groundwater in the unconsolidated zone. Two additional unconsolidated monitoring wells, L12mw-182ss and L12mw-247, were installed under the FWGWMP in 2012 (EQM 2015).

Monitoring well groundwater elevations are collected under the FWGWMP. The groundwater flow pattern at Load Line 12 indicates a complex flow environment, with multiple localized flow environments. Potentiometric data indicate the groundwater table occurs within unconsolidated zone throughout the AOC. Overall groundwater flow in the vicinity of Load Line 12 is to the central portion of the AOC, and an east to west groundwater flow divide exists in the northern quadrant of Load Line 12 near former Buildings 903 and 900. Groundwater north of the divide flows to the north, and groundwater south of the divide flows to the south. A potentiometric low exists in the center of the AOC that causes groundwater to converge near Buildings 901 and 905 where groundwater ultimately flows to the east. Groundwater near L12mw-245 flows west toward the western boundary of Load Line 12. A north to south trending groundwater divide or potentiometric high in the southwestern quadrant of the AOC also exists near L12mw-182 and L12mw-088, causing radial flow to the north and east/southeast away from the southwestern boundary of Load Line 12. Groundwater discharge to surface water features (e.g., via base flow to the Backwater Area of Upper and Lower Cobbs Ponds) occurs outside the AOC boundary. Surface water exits the AOC via the Main Ditch that intersects the Active Area Channel, north of Load Line 12, and surface water flows into the Upper and Lower Cobbs Ponds AOC.

E.1.4 <u>Surface Water</u>

Perennial surface water at Load Line 12 exists throughout the AOC, as shown in Figure 3. The primary surface water conveyance enters from the west through a culvert that conveys drainage from Atlas Scrap Yard. This conveyance, termed the Active Area Channel, traverses Load Line 12 from west to east, flows immediately south of the former Building 904, and intersects the primary north-south drainage ditch between the locations of former Buildings 900 and 901. The Former Settling Pond exists east of the former location of Building 904. This pond is approximately 50 by 250 ft and is linked to the Active Area Channel via an overflow pipe.

The primary north-south drainage feature (Main Ditch) originates near former Building FF-19 and flows north until its intersection with the Active Area Channel. From that point, the Active Area Channel flows north until exiting the AOC under Newton Falls Road, into the North of Active Area. From the North of Active Area, surface water flows into the Backwater Area of the Upper and Lower Cobbs Ponds AOC (RVAAP-29). Another tributary that drains portions of Load Line 3 joins the

tributary draining the North of Active Area into the headwaters (Backwater Area aggregate) of the Upper and Lower Cobbs Pond AOC.

A number of ditches, collectively termed the West Ditches, exist throughout the former production area near former process buildings. Surface water flow in the Main Ditch (above the intersection with the Active Area Channel) and West Ditches is intermittent and driven primarily by storm events. These ditches serve as the storm runoff control system. No below-grade storm drain system was constructed at Load Line 12. When the sanitary sewer system was operational, the sanitary sewer overflow outfall would have occasionally discharged to the Main Ditch at times that the ejector station (Building SD-4) was not functioning or was overloaded. After the ejector station was shut down, but before its demolition, all drainage through the sanitary sewer would have flowed freely through the sanitary overflow outfall associated with the ejector station.

E.1.5 <u>Ecology</u>

Load Line 12 has three types of aquatic resources: ponds, channelized streams/drainage ditches that perennially hold surface water, and wetlands. A field survey conducted by Leidos field biologists at Load Line 12 in May 2010 identified the aquatic resources inside and near the habitat area at Load Line 12. Figure 7 presents these resources near the wet sediment and surface water aggregates. The scope of this ROD does not include terrestrial resources, as the ROD focuses on aquatic resources and media.

In May 2010, a Leidos Professional Wetland Scientist used the Ohio Rapid Assessment Method (Ohio EPA 2001) to assess the condition of the wetland complexes discussed above and to determine its potential ecological importance. Based on the Ohio Rapid Assessment Method, the wetlands are classified as Category 2 (with final scores of 51 and 52), indicating the wetlands are of moderate quality and are degraded with some minor impairment of wetland functions and condition but exhibit reasonable potential for restoration (Appendix H, Figures H-1 and H-2 of the Phase III RI Report [USACE 2017a]). In addition to the two planning level survey wetlands (i.e., based on desktop surveys of wetlands data and resources conducted for OHARNG; e.g., National Wetland Inventory maps and aerials) evaluated within Load Line 12 and North of Active Area, other wetlands are present near Load Line 12.

The northern long-eared bat (*Myotis septentrionalis*; endangered species) exists at CJAG. No other federally listed species and no critical habitat occur on CJAG. Load Line 12 has not had a site-specific survey for federal- or state-listed species. However, surveys have been conducted throughout the facility and have not identified state-listed, federally listed, threatened, or endangered species at the AOC. The closest recorded occurrence of a state- or federally listed species (yellow-bellied sapsucker [*Sphyrapicus varius*]) is located approximately 200 ft north of the stream associated with the North of Active Area (OHARNG 2014).

E.2 Site Investigations

In 1978, the U.S. Army Toxic and Hazardous Materials Agency conducted an Installation Assessment of RVAAP to review the potential for contaminant releases at multiple former operations areas, as documented in the *Installation Assessment of Ravenna Army Ammunition Plant* (USATHAMA 1978). This assessment indicated that historical operations may have utilized lead azide or lead styphnate, which are primary explosives. During the *Relative Risk Site Evaluation for Newly Added Sites* (USACHPPM 1996), explosives were not detected in the soil, sediment, and surface water samples, but several inorganic chemicals were detected.

Since 1978, Load Line 12 has been included in various historical assessments and investigations conducted at the former RVAAP. The following environmental investigations have been completed for Load Line 12:

- Installation Assessment of Ravenna Army Ammunition Plant (USATHAMA 1978),
- Resource Conservation and Recovery Act Facility Assessment (Jacobs 1989),
- Preliminary Assessment for the Characterization of Areas of Contamination (USACE 1996),
- Relative Risk Site Evaluation for Newly Added Sites (USACHPPM 1996),
- 1996 Phase I RI (USACE 1996),
- 2000 Phase II RI (USACE 2004), and
- 2010/2011 2008 Performance-based Acquisition (PBA08) RI (USACE 2017a).

The results of the PBA08 RI sampling were combined with applicable results of previous sampling events to evaluate the nature and extent of contamination, examine contaminant fate and transport, and conduct risk assessments, as summarized in the Phase III RI Report (USACE 2017a).

E.3 Nature and Extent of Contamination

Analytical results from the RIs effectively characterized the wet sediment and surface water nature and extent of contamination at the AOC (USACE 2017a). Figure 8 presents the RI sample locations for these media. Based on previous information and the summary below, it can be concluded that the vertical and horizontal extent of contamination is defined, and no further sampling for wet sediment and surface water is needed to evaluate Load Line 12.

E.3.1 <u>Wet Sediment</u>

E.3.1.1 <u>Active Area Channel</u>

The Active Area Channel was evaluated using six wet sediment samples. All explosive concentrations were below their respective screening levels (SLs) and were not considered chemicals of potential concern (COPCs).

Cyanide and silver concentrations exceeded their regional screening levels (RSLs) at a target risk (TR) of 1E-05, hazard quotient (HQ) of 1 at Phase II RI sample location L12-213 collected in 2000.

An adjacent sample was collected in 2011 to reassess these results, and both silver and cyanide had significantly lower concentrations.

In addition, arsenic and cobalt concentrations exceeded their RSLs at a TR of 1E-05, HQ of 1 at PBA08 RI sample location L12sd-311. The concentration of arsenic was 26 mg/kg, slightly greater than the facility-wide background concentration for sediment (19.5 mg/kg) and the Ohio sediment reference value (25 mg/kg), indicating it was in the range of a naturally occurring concentration.

None of the wet sediment samples had semi-volatile organic compound (SVOC) concentrations greater than their respective Resident Receptor (Adult and Child) facility-wide cleanup goal (FWCUG) at a TR of 1E-05, HQ of 1 with the exception of one polycyclic aromatic hydrocarbon (PAH) (benzo[a]pyrene) at PBA08 RI sample location L12sd-308. The concentration of benzo(a)pyrene at L12sd-308 was 0.41 mg/kg, below the USEPA Resident Soil RSL of 1.1 mg/kg.

Only one volatile organic compound (VOC) (methylene chloride) and one polychlorinated biphenyl (PCB) (PCB-1254) were detected in Active Area Channel wet sediment. These chemicals were detected at Phase II RI sample location L12sd-213 at concentrations below the Resident Receptor FWCUG at a TR of 1E-05, HQ of 1. PCB-1254 also was detected at PBA08 RI sample location L12sd-310, also below the Resident Receptor FWCUG at a TR of 1E-05, HQ of 1. No pesticides were detected in the Active Area Channel wet sediment.

E.3.1.2 Former Settling Pond

One wet sediment sample was collected during the PBA08 RI at the Former Settling Pond. No explosives or propellants were detected in the wet sediment sample. The detected inorganic chemical concentrations were below the SL at a TR of 1E-06, HQ of 0.1 except for aluminum and cobalt, which exceeded the SL at a TR of 1E-06, HQ of 0.1 but not at a TR of 1E-05, HQ of 1. Twelve SVOCs, nine of which were PAHs, were detected in the wet sediment sample but all the concentrations were below their respective SLs. No VOCs, pesticides, or PCBs were detected in wet sediment at the Former Settling Pond.

E.3.1.3 North of Active Area

The North of Active Area was evaluated using eight wet sediment samples. All explosive concentrations were below their respective SLs and were not considered COPCs. All of the detected inorganic chemical concentrations in wet sediment were below the SLs at a TR of 1E-06, HQ of 0.1 except for aluminum and cobalt, which exceeded the SL at a TR of 1E-06, HQ of 0.1, but not at a TR of 1E-05, HQ of 1.

Twenty SVOCs, the majority of which were PAHs, were detected in wet sediment at the North of Active Area. Three PAH concentrations (benzo[a]pyrene, benzo[b]fluoranthene, and dibenzo[a,h]anthracene) exceeded their SLs at a TR of 1E-06, HQ of 0.1. Benzo(a)pyrene at L12sd-306 exceeded the FWCUG at a TR of 1E-05, HQ of 1, but the concentration of 0.24 mg/kg is below the USEPA Resident Soil RSL of 1.1 mg/kg.

Four VOCs (2-butanone, methylene chloride, acetone, and toluene) were detected in wet sediment at the North of Active Area, but the detected concentrations were below the SLs at a TR of 1E-06, HQ of 0.1. No pesticides or PCBs were detected in wet sediment at the North of Active Area.

E.3.2 <u>Surface Water</u>

Surface water at Load Line 12 is present perennially within the Active Area Channel and Former Settling Pond. The series of constructed channels within Load Line 12 convey drainage from within Load Line 12 toward the North of Active Area. Very few explosives or propellants were detected, and those samples where explosives or propellants were detected were all below a TR of 1E-05, HQ of 1.

Aluminum, arsenic, and lead were considered COPCs in surface water. Although not identified as being previously used during historical operations, cobalt, iron, manganese, and silver also were considered COPCs. Arsenic, cobalt, and lead concentrations exceeded their SLs; however, cobalt and lead do not have Resident Receptor FWCUGs. The weight-of-evidence presentation in the HHRA within the Phase III RI Report concluded that these chemicals do not require remediation.

Seven SVOCs, all of which were PAHs except bis(2-ethylhexyl)phthalate, were detected in surface water at Load Line 12. Of the seven SVOCs, four (benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and bis[2-ethylhexyl]phthalate) were detected at concentrations above their respective SLs at a TR of 1E-06, HQ of 0.1. Four SVOCs (benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and bis[2-ethylhexyl]phthalate) exceeded their respective Resident Receptor (Adult and Child) FWCUGs at a TR of 1E-05, HQ of 1. These PAHs were detected in a surface water sample at L12sw-308. Sample location L12-308 is a concrete box culvert upgradient of Load Line 12 that receives runoff from Paris-Windham Road, an expected source of the elevated PAH concentrations.

Two VOCs (carbon disulfide and methylene chloride) and one pesticide (delta-BHC) were detected in surface water. The VOC and pesticide were detected at low, estimated concentrations. No PCBs were detected in surface water at Load Line 12.

E.4 Conceptual Site Model

Conceptual site model elements are discussed in this section, including primary and secondary contaminant sources and release mechanisms, contaminant migration pathways and discharge or exit points, and potential human receptors and ecological resources.

E.4.1 Primary and Secondary Contaminant Sources and Release Mechanisms

No primary contaminant sources (e.g., operational facilities) are currently located at Load Line 12. The potential mechanisms for contaminant releases from secondary sources at Load Line 12 include:

• Eroding soil with sorbed contaminants and mobilization in turbulent surface water flow under storm conditions,

- Dissolving soluble contaminants and transport in surface water,
- Re-suspending contaminated sediment during periods of high flow with downstream transport within the surface water system, and
- Contaminant leaching to groundwater.

E.4.2 <u>Contaminant Migration Pathways and Exit Points</u>

The potential for sediment contaminants to impact groundwater was evaluated in a fate and transport evaluation presented in the Phase III RI Report (USACE 2017a). Contaminants in surface soil may migrate to surface water via drainage ditches in the dissolved phase following a storm event, or as particulates in storm water runoff.

All site-related contaminants (SRCs) identified in sediment at Load Line 12 were evaluated through the stepwise contaminant fate and transport evaluation. The evaluation included analyzing leaching and migration from wet sediment to groundwater and determining whether contamination present in sediment may potentially impact groundwater quality at the site.

Maximum SRC concentrations identified in sediment were evaluated using a series of generic screening steps to identify contaminant migration chemicals of potential concern (CMCOPCs). Chemical-specific dilution attenuation factors were calculated using co-located surface water and sediment concentrations for the identified sediment SRCs. These dilution attenuation factors were used in the sediment screening analysis to identify CMCOPCs based on RVAAP facility-wide background concentrations and the lowest risk-based screening criteria among USEPA maximum contaminant levels, USEPA tap water RSLs, or RVAAP groundwater FWCUGs for the Resident Receptor Adult. CMCOPCs were further evaluated using the Analytical Transient 1-, 2-, 3-Dimensional model to predict groundwater concentrations beneath source areas and at the nearest downgradient groundwater receptor to the AOC.

The evaluation of modeling results identified the following CMCOPCs for sediment:

- Antimony, arsenic, cyanide, lead, mercury, TNT, benz(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, and PCB-1254 from the Active Area Channel; naphthalene from the Former Settling Pond; and antimony, cadmium, hexavalent chromium, lead, mercury, silver, TNT, benz(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and naphthalene from the North of Active Area were predicted to exceed the screening criteria in groundwater beneath the sediment source areas; however, none of these CMCOPCs were predicted to be above their respective groundwater criteria at the downgradient receptor location.
- 1,3-Dinitrobenzene from the North of Active Area was the only CMCOPC that exceeded the screening criteria beneath the source as well as at the downgradient receptor location.

A qualitative weight-of-evidence assessment of the sample results with respect to current AOC groundwater data and considerations of the limitations and assumptions of the models were performed to identify if any contaminant migration COCs are present in sediment that may impact the

groundwater beneath the source or at the downstream receptor locations. This qualitative assessment concluded that there were no contaminant migration COCs present in sediment that may impact the groundwater beneath the sediment source areas. No further action is required for sediment at Load Line 12 for the protection of groundwater. Groundwater will be further evaluated under the FWGWMP.

E.4.3 <u>Potential Human Receptors and Ecological Resources</u>

In February 2014, the Army and Ohio EPA amended the risk assessment process to address changes in the RVAAP restoration program.

The Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP Installation Restoration Program (ARNG 2014) identified the following three Categorical Land Uses and Representative Receptors to be considered during the RI phase of the CERCLA process.

- 1. Unrestricted (Residential) Land Use Resident Receptor (Adult and Child) (formerly called Resident Farmer).
- 2. Military Training Land Use National Guard Trainee.
- 3. Commercial/Industrial Land Use Industrial Receptor (USEPA Composite Worker).

An evaluation using Resident Receptor (Adult and Child) FWCUGs was used to provide an Unrestricted (Residential) Land Use evaluation. If a site meets the standards for Unrestricted (Residential) Land Use, it can be used for all categories of Land Use at CJAG. No wet sediment or surface water COCs were identified as requiring remediation to be protective for the Resident Receptor or Unrestricted (Residential) Land Use.

The Level I Scoping Level ERA presents important ecological resources on or near the AOC and evaluates the potential for current contamination to impact ecological resources at Load Line 12. Because contamination is at or near the important resources (wetlands and surface water), these findings invoked a requirement for a Level II ERA. The Level II ERA incorporated available data to identify integrated chemicals of potential ecological concern (COPECs). The Level II ERA concluded that there are no COPECs requiring remediation or further evaluation to be conducted to protect the environment.

F CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

Load Line 12 is currently managed by ARNG/OHARNG. The AOC is not currently being utilized for training purposes. The future use of Load Line 12 is Military Training. The Resident Receptor (Adult and Child) was evaluated in the HHRA to assess an Unrestricted (Residential) Land Use scenario. This ROD discusses future Land Use, as it pertains to wet sediment and surface water and how it impacts human health, the environment, and groundwater.

G SUMMARY OF SITE RISKS

The HHRA and ERA estimated risks to human receptors and ecological resources; identified exposure pathways; COCs and COPECs, if any; and provided a basis for remedial decisions. This section of the ROD summarizes the results of the HHRA and ERA, which are presented in detail in the Phase III RI Report (USACE 2017a) and Load Line 12 Proposed Plan (USACE 2017b) located in the Administrative Record and Information Repositories.

G.1 Human Health Risk Assessment

The HHRA did not identify any COCs in wet sediment or surface water that pose unacceptable risk to the Resident Receptor (Adult and Child). Because there is no unacceptable risk to the Resident Receptor, it can be concluded that there is no unacceptable risk to the National Guard Trainee and Industrial Receptor.

Media of concern at Load Line 12 addressed under this ROD are wet sediment and surface water. Wet sediment was evaluated from three areas based on former process operations and drainage areas within Load Line 12: the Active Area Channel, Former Settling Pond, and North of Active Area. Wet sediment samples were collected from site drainage ditches and the settling pond. Surface water from Load Line 12 was assessed as one exposure unit.

No COCs were identified for the Resident Receptor (Adult and Child) in the media of concern; therefore, no other receptors were evaluated, and no further action is recommended from a human health risk perspective.

G.2 Ecological Risk Assessment

The ecological habitat at Load Line 12 consists of approximately 1.6 acres of aquatic habitat, including the Active Area Channel (0.43 acres), Former Settling Pond (0.26 acres), and North of Active Area (0.88 acres). Surface water flows into a series of drainage ditches that converge to drain into Upper and Lower Cobbs Ponds in the northeastern corner of the AOC; this is sufficient to maintain aquatic habitat.

The northern long-eared bat (*Myotis septentrionalis*; federally threatened) exists at CJAG. No other federally listed species or critical habitats are located on CJAG. Load Line 12 has not had a site-specific survey for federal- or state-listed species. However, surveys have been conducted throughout the facility and have not identified state-listed, federally listed, threatened, or endangered species at the AOC. The closest recorded occurrence of a state- or federally listed species (yellow-bellied sapsucker [*Sphyrapicus varius*]) is located approximately 200 ft north of the stream associated with the North of Active Area (OHARNG 2014).

The Level I Scoping ERA presents the important and significant ecological resources on the AOC and evaluates the potential for current contamination to impact ecological resources. This contamination

was identified using historical and PBA08 RI data. Ecological resources at Load Line 12 were compared to the list of important ecological places and resources. Based on the 39 criteria defining important places and resources as identified by the Army and Ohio EPA, Wetlands 1 and 2 (shown in Figure 7) and surface water are important and significant ecological resources (because contamination is at or near the important resources) at Load Line 12 (USACE 2017a). These findings invoked a requirement of a Level II ERA. The Level II ERA incorporated available data to identify integrated COPECs. A total of 54 integrated COPECs were identified for wet sediment; 14 integrated COPECs were identified for surface water.

The wet sediment and surface water COPECs were further evaluated with technical and refinement factors agreed upon by the Army and Ohio EPA. The results concluded that no chemicals required remediation or further evaluation to be protective of the environment. Per the *Guidance for Conducting Ecological Risk Assessments* (Ohio EPA 2008), sufficient justification exists to recommend no further action to be protective of ecological receptors at Load Line 12.

H DOCUMENTATION OF NO SIGNIFICANT CHANGE

The Load Line 12 Proposed Plan (USACE 2017b) was released for public comment on June 6, 2018. Feedback received from the public during the public comment period and public meeting are presented in Part III of this ROD. The proposed plan recommends no further action for wet sediment and surface water at Load Line 12. No significant changes were necessary or appropriate following the conclusion of the public comment period.

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PART III: RESPONSIVENESSSUMMARYFORPUBLICCOMMENTS ON THE ARMYPROPOSEDPLANFORRVAAP-12LOAD LINE 12

A OVERVIEW

On June 6, 2018, the Army released the Load Line 12 Proposed Plan (USACE 2017b) for public comment. A 30-day public comment period was held from June 6, 2018 to July 6, 2018. The Army hosted a public meeting on June 21, 2018 to present the proposed plan and take questions and comments from the public for the record. This public comment period and public meeting also included proposed plans for Load Line 7, Load Line 9, Wet Storage Area, and Upper and Lower Cobbs Ponds.

For wet sediment and surface water at Load Line 12, the Army recommended no further action. During the public meeting, Ohio EPA concurred with the recommendation of no further action. Comments provided during the public comment period and public meeting are summarized in the following section.

The community voiced no objections to the no further action recommendation. All public input was considered during the selection of the final remedy for soil, surface water, and sediment at Load Line 12 in this ROD.

B STAKEHOLDER ISSUES AND LEAD AGENCY RESPONSES

The following subsections summarize the oral and written comments provided during the public comment period and public meeting. ARNG's responses provided below are considered final upon approval of the Final ROD.

B.1 Oral Comments from Public Meeting

Comment 1: What impacts or what will occur when you excavate the contaminated soil? Is there any testing that is done to monitor airborne contaminants?

Response: The recommended alternative for Load Line 12 is "no further action," as wet sediment and surface water were determined to not require a remedial action. Consequently, there will be no excavation activities at this site. Generally, excavating contaminated soil includes using engineering controls to mitigate risk from airborne contaminants to workers and the community. These controls include performing constant visual inspections to verify that excessive dust is not created in excavation or transport, wetting the contaminated soil if dust is created, and ensuring the contaminated soil is covered when in the haul trucks prior to exiting the site.

If contaminated media are at concentrations that airborne particulates can pose unacceptable risk to workers or the community via an airborne pathway, the Remedial Design will specify that air monitoring equipment will be onsite and continually monitored.

B.2 Written Comments

Comment 1: What happens to Sand Creek after the exit from the arsenal area into Windham? Response: Sand Creek flows through the center of the former RVAAP (CJAG), generally in a northeast direction to its confluence with South Fork Eagle Creek. This confluence is just inside the CJAG perimeter fence. After the confluence, South Fork Eagle Creek exits CJAG between Windham Road and Snow Road and continues in a northerly direction for approximately 3 miles to its confluence with Eagle Creek.

C TECHNICAL AND LEGAL ISSUES

There were no technical or legal issues raised during the public comment period.

- ARNG (Army National Guard) 2014. Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the Ravenna Army Ammunition Plant (RVAAP) Installation Restoration Program, Portage/Trumbull Counties, Ohio. Memorandum between ARNG-ILE Cleanup and the Ohio Environmental Protection Agency. February 2014.
- EQM (Environmental Quality Management, Inc.) 2015. *Final Facility-wide Groundwater Monitoring Program Annual Report for 2014, Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio.* March 2015.
- Jacobs (Jacobs Engineering Group, Inc.) 1989. Resource Conservation and Recovery Act Facility Assessment, Preliminary Review/Visual Site Inspection Ravenna Army Ammunition Plant Ravenna, Ohio. October 1989.
- MKM (MKM Engineers, Inc.) 2007. Final Characterization of 14 AOCs at Ravenna Army Ammunition Plant. March 2007.
- OHARNG (Ohio Army National Guard) 2008. Updated Integrated Natural Resources Management Plan for the Ravenna Training and Logistics Site, Portage and Trumbull Counties, Ohio. March 2008.
- OHARNG 2014. Integrated Natural Resources Management Plan at the Camp Ravenna Joint Military Training Center, Portage and Trumbull Counties, Ohio. December 2014.
- Ohio EPA (Ohio Environmental Protection Agency) 2001. Ohio Rapid Assessment Method for Wetlands v. 5.0, User's Manual and Scoring Forms. Division of Surface Water, 401/Wetland Ecology Unit. February 2001.
- Ohio EPA 2004. Director's Final Findings and Orders for the Ravenna Army Ammunition Plant. June 2004.
- Ohio EPA 2008. *Guidance for Conducting Ecological Risk Assessments (Ohio EPA)*. Division of Emergency and Remedial Response. April 2008.
- USACE (U.S. Army Corps of Engineers) 1996. Preliminary Assessment for the Characterization of Areas of Contamination at the Ravenna Army Ammunition Plant, Ravenna, Ohio. February 1996.
- USACE 2004. Phase II Remedial Investigation Report for Load Line 12 at the Ravenna Army Ammunition Plant, Ravenna, Ohio. March 2004.
- USACE 2009. Record of Decision for Soil and Dry Sediment for the RVAAP-12 Load Line 12 at the Ravenna Army Ammunition Plan, Ravenna, Ohio. March 2009.

- USACE 2017a. Phase III Remedial Investigation Report for Wet Sediment Surface Water at RVAAP-12 Load Line 12, Former Ravenna Army Ammunition Plant Portage and Trumbull Counties, Ohio. February 2017.
- USACE 2017b. Proposed Plan for Wet Sediment and Surface Water at RVAAP-12 Load Line 12, Former Ravenna Army Ammunition Plant Portage and Trumbull Counties, Ohio. November 2017.
- USACE 2017c. Feasibility Study Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12, Former Ravenna Army Ammunition Plant Portage and Trumbull Counties, Ohio. June 2017.
- USACHPPM (U.S. Army Center for Health Promotion and Preventative Medicine) 1996. *Hazardous* and Medical Waste Study No. 37-EF-5360-97 Relative Risk Site Evaluation, Ravenna Army Ammunition Plant. November 1996.
- USATHAMA (U.S. Army Toxic and Hazardous Materials Agency) 1978. *Installation Assessment of Ravenna Army Ammunition Plant*, Records Evaluation Report No. 132. November 1978.
- USDA (U.S. Department of Agriculture) 2010. Soil Map of Portage County, Version 4. Website: www.websoilsurvey.nrcs.usda.gov. January 2010.
- Vista (Vista Sciences Corporation) 2017. Community Relations Plan 2017 for the Ravenna Army Ammunition Plant Restoration Program. March 2017.

FIGURES

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Figure 2. Camp James A. Garfield Installation Map



Figure 3. Load Line 12 Site Features



Figure 4. Load Line 12 Spatial Aggregates



Figure 5. Geologic Map of Unconsolidated Deposits on Camp James A. Garfield



Figure 6. Geologic Bedrock Map and Stratigraphic Description of Units on Camp James A. Garfield



Figure 7. Aquatic Resources Inside and Near the Habitat Area at Load Line 12

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Figure 8. Load Line 12 Sample Locations

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APPENDIX A

Affidavits

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Affidavit of Publication, Tribune Chronicle, June 6, 2018

PROOF OF PUBLICATION NOTICE OF DOCUMENT AVAILABILITY NOTICE OF DOCUMENT AVAILABILITY Proposed Plans for Load Line 7, Load Line 9, Load Line 12, Wet Storage Area and Upper and Lower Cobbs Ponds at the Former Ravenna Army Ammunition Plant (RVAAP) The Proposed Plans for Load Line 7, Load Line 12, and Upper and Lower Cobbs Ponds each present a recommendation. The Proposed Plans for Load Line 9 and Wet Storage Area present the preferred alternative, Ex-situ Thermal Treatment. These Proposed Plans are now available for public review for 30 days from June 8, 2018 to July 6, 2018. The Proposed Plans are evailable at: Newton Falls Public Library 204 South Canal Street 167 East Main Street STATE OF OHIO SS PAMELA EAZOR TRUMBULL COUNTY BEING DULY SWORN, UPON OATH STATES THAT SHE IS AN AUTHORIZED REPRESENTATIVE OF THE TRIBUNE CHRONICLE, (A DIVISION OF EASTERN OHIO NEWSPAPERS INC) A DAILY NEWSPAPER PRINTED IN THE CITY OF WARREN, COUNTY OF TRUMBULL, STATE OF OHIO AND OF Newton Falls Public Lorary Heed Memoral Lorary 204 South Canal Street 167 East Main Street Newton Falls, Ohio 44444 Bavenna, Ohio 44266 The Proposed Plans are also available at www.rxaap.org Please join us for an OPEN HOUSE and PUBLIC MEETING. The Army will host an informational open house and a public meeting to explain the recommendations in the Proposed Plans. Oral and written comments will be accented at the presting. Written comments may be GENERAL CIRCULATION IN THE CITY OF WARREN, TRUMBULL COUNTY, OHIO AND IS INDEPENDENT IN POLITICS. THAT THE ATTACHED ADVERTISEMENT WAS PUBLISHED IN THE TRIBUNE CHRONICLE EVERY comments will be accepted at the meeting. Written comments may be mailed to the Camp Ravenna Environmental Office, 1438 State Route 534 SW, Newton Falls, OH 44444. Comments will be accepted during the pub-tic comment period from June 6, 2018 to July 6, 2018. DNE FOR VE WEEKS AND THAT THE FIRST INSERTION WAS CONSECUT The public meeting is scheduled for: Thursday, June 21, 2018 6:00 pm Open House 6:30 pm Public Meeting Rİ ,th SAU Shearer Community Center DAY THE ON (Paris Township Hall) 9355 Newton Falls Road Ravenna, OH 44266 2 OF For more information or If you need special accommodations to attend, please contact Katie Tait at 614-336-6136. #157-1T-June 6, 2018 #3674 SWORN TO BEFORE ME AND SUBSCRIBED IN MY PRESENCE ON THIS ቧ 01 3640 DAY OF NOTARY PUBLIC CONSTANCE A. PACEK Notary Public, State of Ohio My Commission Expires March 7, 2021 ADVERTISING COST \$ 283, 32

Affidavit of Publication, Record Courier, June 6, 2018



Proof of Publication Record Publishing Company 1050 W. Main Street, Kent, OH 44240 Phone (330) 541-9400 Fax (330) 673-6363

Limess 16

I. My being first duly sworn depose and say that I am Advertising Clerk of Record Publishing Company

30 Record-Courier a newspaper printed and published in the city of Kent, and of General circulation in the County of Portage, State of Ohio, and personal knowledge of the facts herein stated and that the notice hereto annexed was Published in said newspapers for 1 insertions on the same day of the week from and after the 6th day of June, 2018 and that the fees charged are legal.

Name of Account: Leidos Ad Number: 12454540 No. of Lines: 28

Day(s) Published: 06/06. Printers Fee: \$115.20

Pandsubscribed before this 6th day of June, 2018.

Elizabeth McDaniel Notary Public Commission Expires June 19, 2021

Notice of Document Availability



Proposed Plans for Load Line 7, Load Line 9, Load Line 12, Wet Storage Area and Upper and Lower Cobbs Ponds at the Former Ravenna Army Ammunition

Plant (RVAAP)

The Proposed Plans for Load Line 7, Load Line 12, and Upper and Lower Cobbs Ponds each present a recommendation of No Further Action and provide the rationale for this recommendation. The Proposed Plans for Load Line 9 and Wet Storage Area present the preferred alternative, Ex-situ Thermal Treatment. These Proposed Plans are now available for public review for 30 days from June 6, 2018 to July 6, 2018.

The Proposed Plans are available at:

Newton Falls Public Library 204 South Canal Street Newton Falls, Ohio 44444 Reed Memorial Library 167 East Main Street Ravenna, Ohio 44266

The Proposed Plans are also available at: www.rvaap.org Please join us for an OPEN HOUSE and PUBLIC MEETING.

The Army will host an informational open house and a public meeting to explain the recommendations in the Proposed Plans. Oral and written comments will be accepted at the meeting. Written comments may be mailed to the Camp Ravenna Environmental Office; 1438 State Route 534 SW, Newton Fails, OH 44444. Comments will be accepted during the public comment period from June 6, 2018 to July 6, 2018.

at:

The public meeting is scheduled for:

Thursday June 21, 2018 6:00 pm Open House 6:30 pm Public Meeting Shearer Community Center (Paris Township Hall) 9355 Newton Falls Road Ravenna, OH 44265

For more information or if you need special accommodations to attend, please contact Katie Tait at 614-336-6136.

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APPENDIX B

Ohio EPA Correspondence

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John R. Kasich, Governor Mary Taylor, Lt. Governor Craig W. Butler, Director

January 7, 2019

Mr. David Connolly Army National Guard Directorate Environmental Programs Division ARNG-ILE-CR 111 South George Mason Drive Arlington, VA 22204

US Army Ravenna Ammunition Plt RVAAP Remediation Response Project records Remedial Response Portage County 267000859122

Subject: Draft Decision Document for Wet Sediment and Surface Water at Load Line 12 for the Former Ravenna Army Ammunition Plant (RVAAP) Document, (Work Activity No. 267-000859-122) Received on November 30, 2018

Re:

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) received the Draft Decision Document for Wet Sediment and Surface Water at RVAAP-12 Load Line 12 on November 30, 2018.

The Army held a public comment period from June 6, 2018 to July 6, 2018 and held an open house/public meeting to present the conclusions and investigative findings for Wet Sediment and Surface Water at RVAAP-12 Load Line 12 on June 21, 2018. One oral comment was received during the public meeting, and one written comment was received. Neither comment was directly related to the proposed remedy identified in the Proposed Plan for RVAAP-12 Load Line 12 Wet Sediment and Surface Water. No technical or legal issues were raised during the public comment period.

Ohio EPA has no comments on the draft Decision Document for Wet Sediment and Surface Water at Load Line 12. If you have questions, please contact me at (330) 963-1201.

Sincerely,

Man

Sue Netzly-Watkins Division of Environmental Response and Revitalization

SN-W/nvp

ec: Craig Coombs, USACE, Louisville District Katie Tait, OHARNG RTLS Rebecca Shreffler, Chenega Pat Ryan, Leidos-REIMS Bill Damschroder, Legal Brian Tucker, Ohio EPA, DERR, CO Tom Schneider, Ohio EPA, DERR, SWDO

Nat Peters, II, USACE Louisville District Kevin Sedlak, OHARNG RTLS Jed Thomas, Leidos Mark Johnson, Ohio EPA, NEDO, DERR Bob Princic, Ohio EPA, NEDO, DERR Carrie Rasik, Ohio EPA, DERR, CO

Northeast District Office • 2110 East Aurora Road • Twinsburg, OH 44087-1924 epa.ohio.gov • (330) 963-1200 • (330) 487-0769 (fax) THIS PAGE INTENTIONALLY LEFT BLANK